Group A: Underground Construction Breakout Session (Wednesday, July 20th at 9:40am ET)

Reminder!!

Respond to Polling Questions:

1. Scan the QR code using your mobile device or;

2. Type the following link into any web browser:

bit.ly/3o3cZCH

Question: 1

What does a system-level underground construction technology need to look like in order to cost-effectively convert an overhead three-phase main feeder line in a densely populated urban area to underground? Provide as much details as possible with anticipated workflows.

Question: 2

How technically feasible is it to build essential elements of underground power distribution system (boreholes, conduits, junction boxes, and surface access points) with minimal to no surface disruption (e.g., stopping traffic, repaving the road, restoring the landscape, and potentially compensating those affected)? Would such strategies drastically cut construction costs while also improving safety and speed? What technological gaps exist?

Question: 3

Would concurrent (or on-site, in situ) construction of components such as boreholes, conduits, and cables reduce the overall cost? How realistic is it to implement? Is there any technology that is lacking?

Question: 4

How should underground construction technologies, including structures produced with them, be objectively evaluated and compared? What is the bare minimum scale of the technology that should be delivered to warrant pilot size testing and eventual scale-up for market adoption? Would those goals be met in a three-year R&D project (average ARPA-E project timeline)?

Question: 5

How critical is it to establish continuous construction runs (e.g. >5,000') while building essential underground structures for power distribution from boreholes, to conduits, joint boxes, and vertical access points? Would such a capability necessary for a certain target area (e.g. urban, suburban, rural areas) for cost-effective and speedy underground power distribution build out or conversion? Are there any technical challenges we must overcome to enable a long continuous construction run?

Question: 6

Spoils/soils management is considered a high cost for undergrounding powerlines. Are there opportunities for technology development to minimize spoils/spalling, such as recycling spoils/spalling and (or) drilling practices that reduce spoils/spalling? Is blowout pressure a concern at the depths (3-6') to underground powerlines?

Question: 7

Is it possible to produce variable hole diameters in situ at a shallow depth (3-6') using drilling technology? How feasible is it to build junction boxes/surface access points cost-effectively by creating larger voids at specific intervals along the drill path? How could such a subterranean structure be built without collapsing?

Question: 8

Transformative and cost-effective underground distribution power grid construction technologies may open up new opportunities for other related civil works. What are the most promising opportunities in the near future?

Reminder: Q&A Metrics Table Link for Construction and Surveying

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https://bit.ly/3OuMvEZ

Poll Question: 1 (REMINDER)

What are the key constraints to the speed of building out underground power distribution lines (excluding green field construction, permitting, ROW and easement acquisitions)?

a) Surveying/characterization
b) Surface preparation
c) Equipment mob/demob
d) Drilling
e) Spoil management
f) Conduit installation
g) Placement of junction boxes
h) Installing surface access points
i) Cable pulling
j) Cable splicing
k) Surface restoration
l) Others (specify)

Poll Question: 2 (REMINDER)

Rank the following methods in terms of the importance for technological advancements in underground power distribution construction.

a) Subsurface surveying/characterization
b) Trenching technologies
c) Drilling/trenchless technologies
d) Spoil management in drilling
e) Conduit installation
f) Pulling cables
g) Construction and placement of junction boxes (e.g. vaults)
h) Splicing cables
i) Construction of surface access points (e.g. manholes)
j) Other methods (please describe)

Poll Question: 3 (REMINDER)

Rank the following metrics in terms of their contribution to the overall cost of undergrounding if they are transformed from their existing state-of-the-art levels.

a) Rig footprint
b) Power requirements to run rig
c) Rate of penetration (ROP)
d) Steerability in drilling operation
e) Drill through multiple geologic conditions with a single tool
f) Less spoils
g) Reduced inadvertent return
h) Variable bore diameters within a single tool
i) Continuous drilling operation (less number of restart, e.g. aided by measure while drill)
j) Other (specify)